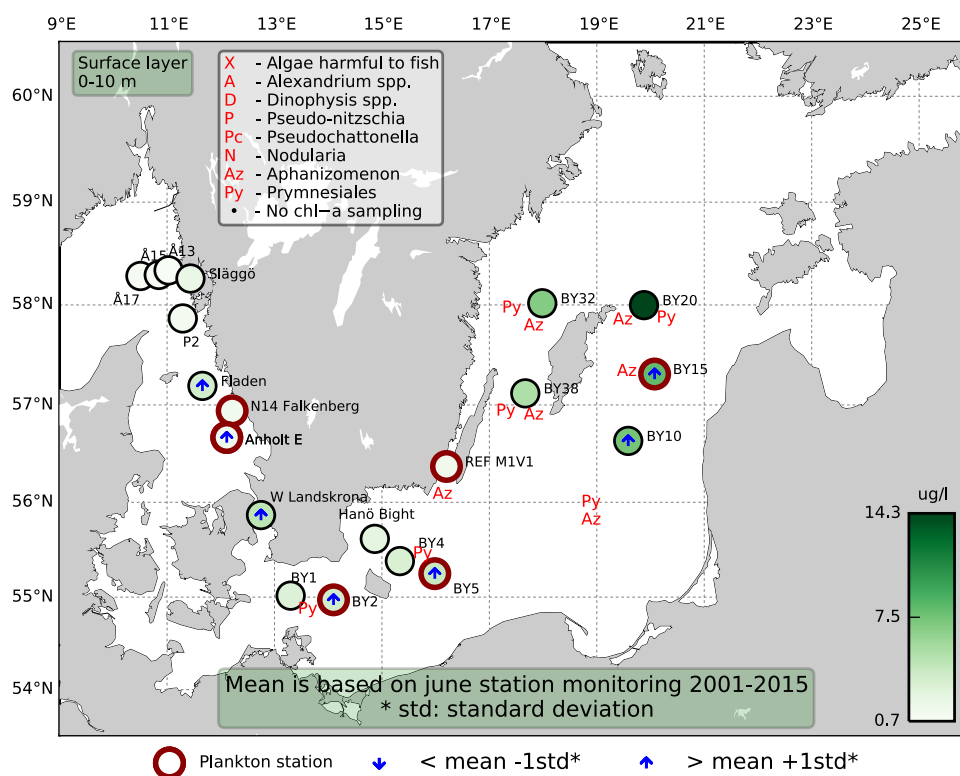


### Sammanfattning

Växtp planktondiversiteten var generellt ganska låg i Västerhavet och rätt små klorofyllfluorescenstoppar orsakades av ett fåtal kiselalger och dinoflagellatsläktet *Ceratium*.

I Östersjön var blomningen av filamentösa cyanobakterier i full gång. *Aphanizomenon flos-aquae* dominerade i proverna och vid de flesta stationer fanns bara enstaka av den potentiellt toxiska arten *Nodularia spumigena*\*. Mest vanlig var *N. spumigena*\* vid REF M1V1 och BY38. Små områden med ytansamlingar observerades mellan BY29 och BY20, mellan BY38 och BY32 samt nordväst om BY15. Klorofyllfluorescenstoppar vid Östersjöstationerna orsakades av den potentiellt skadliga gruppen Prymnesiales\* och kolonier av pico cyanobakterier.



### Abstract

The phytoplankton diversity was generally low in the Kattegat and Skagerrak areas. Rather small chlorophyll fluorescence peaks were caused by a few diatom species and the dinoflagellate genus *Ceratium*.

The summer bloom of cyanobacteria was ongoing in the Baltic Sea. *Aphanizomenon flos-aquae* dominated in the samples and at most stations there were just a few filaments of the potentially toxic species *Nodularia spumigena*\*. *N. spumigena*\* was the most abundant at REF M1V1 and at BY38. Small patches of surface accumulations were observed between BY29 and BY20, between BY38 and BY32 as well as northwest of BY15. Chlorophyll fluorescence peaks at the Baltic stations were caused by the potentially harmful algae group Prymnesiales\* and colonies of pico cyanobacteria.

Below follows a more detailed information on species composition and abundance. Species marked with \* are potentially toxic or harmful.

## The Skagerrak

### Å17 (open Skagerrak) 18<sup>th</sup> of June

The phytoplankton diversity was very low, the diatom *Proboscia alata* and the dinoflagellate *Ceratium fusus* were common.

Modest chlorophyll fluorescence peaks at 25 to 40 meters depths at Å15, Å16 and Å17 were partially caused by the potentially toxic diatom *Pseudo-nitzschia* spp.\* and a few other diatoms. The potentially toxic dinoflagellate *Azadinium* sp.\* was present, as was the coccolithophorid *Emiliana huxleyi*.

### Släggö (Skagerrak coast) 18<sup>th</sup> of June

A few diatoms and dinoflagellates were observed in the phytoplankton sample of which the diatom *Guinardia delicatula* and *Ceratium* species were the most abundant.

## The Kattegat

### Anholt E and N14 Falkenberg 17<sup>th</sup> and 19<sup>th</sup> of June

The phytoplankton diversity was similar to the one at Släggö, but *Dactyliosolen fragilissimus* was the most abundant diatom.

The rather modest fluorescence peaks in the Kattegat area were caused by diatoms and *Ceratium* species.



The dinoflagellate genus *Ceratium* was abundant in the Kattegat and Skagerrak. The species in the picture are *C. macroceros* (left) and *C. tripos*.

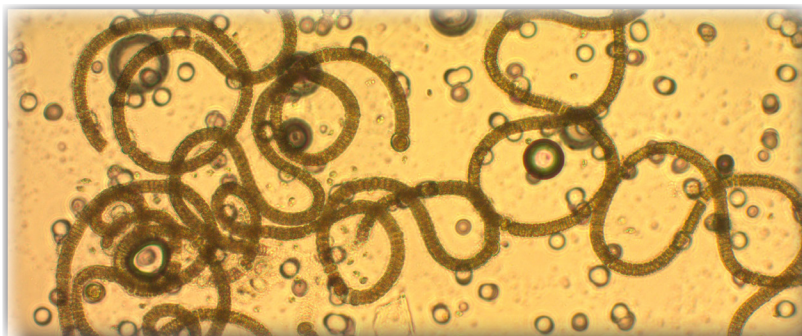
## The Baltic Sea

During the cruise there was extra focus on the filamentous cyanobacteria when AlgAware is concerned. Microscope analysis were performed on board and additional analysis were made at the SMHI laboratory to find small species such as the potentially harmful flagellate *Chrysochromulina* sp.\*, which bloomed and caused fluorescence peaks at many of the Baltic stations. Bucket sampling from the surface water was performed at many of the stations to find the composition of filamentous cyanobacteria there.

Small patches of surface accumulations of cyanobacteria were observed between BY29 and BY20, northwest of BY15 and between BY38 and BY32.

In all of the surface samples except at BY15, the *Aphanizomenon flos-aquae* filaments had aggregated but no surface accumulations were observed at any stops. At BY15, *A. flos-aqua* was very abundant but the filaments had not aggregated, they were separately scattered. The potentially toxic cyanobacterium *Nodularia spumigena*\* was present at all stations south and west of BY20 although *A. flos-aquae* was the dominant species. The cyanobacteria bloom had come the farthest in the eastern and western parts of the Baltic Proper. The abundancies were a lot lower in the southern parts between BY1 and BY5.

Chlorophyll fluorescence maxima at BY1, BY2, BY4, BY5, 4CTRY BP, BY20, BY32, BY38 and the Hanö Bight were caused by a bloom of the potentially harmful flagellate *Chrysochromulina* sp.\*. Colonies of pico cyanobacteria were also very abundant at these points.



The potentially toxic cyanobacterium *Nodularia spumigena*\* was present at most of the Baltic stations.

### BY2 and BY5 16<sup>th</sup> and 17<sup>th</sup> of June

The weather conditions were rather windy in the area which caused the cyanobacteria to be mixed down in the water. The phytoplankton diversity was low, the filamentous cyanobacteria were found in low amounts.

### REF M1V1 Kalmar Sound and BY38 20<sup>th</sup> of June

The filamentous cyanobacterium *Aphanizomenon flos-aquae* was abundant and the potentially toxic species *Nodularia spumigena* was found in the highest amounts compared to all of the other stations during this cruise. There were no surface accumulations but cyanobacteria grains were observed in the water.

### 4CTRY BP 16<sup>th</sup> of June

This station is sampled instead of BCSIII-10 for the time being.

The filamentous cyanobacterium *Aphanizomenon flos-aquae* and the chlorophyte *Planctonema lauterbornii* were rather abundant.

### BY15 15<sup>th</sup> of June

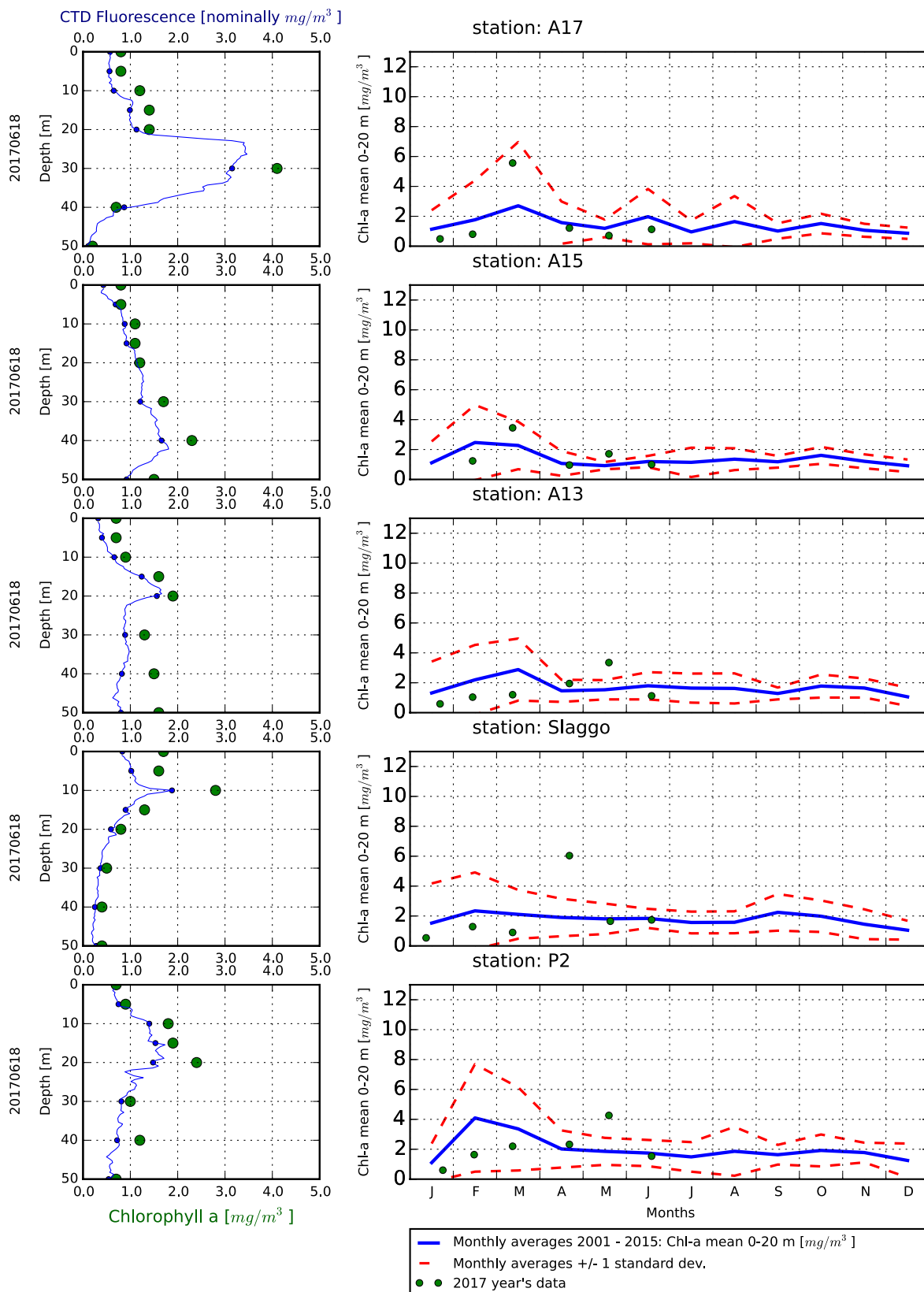
The filamentous cyanobacterium *Aphanizomenon flos-aquae* was abundant and naked dinoflagellates and the ciliate *Mesodinium rubrum* were quite numerous

Selection of observed species	N14	Anholt E	Anholt E	Släggö	Å17
Red=potentially toxic species	19/6	17/6	19/6	18/6	18/6
Hose 0-10 m	presence	presence	presence	presence	presence
Cylindrotheca closterium	present				
Dactylosolen fragilissimus	very common	very common	common	present	
Guinardia delicatula	present	present	present	common	
Proboscia alata	present	common	present	present	common
Pseudo-nitzschia spp				present	
Pseudosolenia calcar-avis		present			
Skeletonema marinoi	present				
Thalassionema nitzschioides	present	common	present		
Ceratium furca				present	
Ceratium fusus	present	present	common	common	common
Ceratium lineatum				present	
Ceratium longipes	present	present	present	present	
Ceratium macroceros		present	present	present	present
Ceratium tripos	common	common	common	common	present
Dinophysis acuminata	present		present	present	
Dinophysis norvegica	present			present	
Proto-peridinium pellucidum			present		

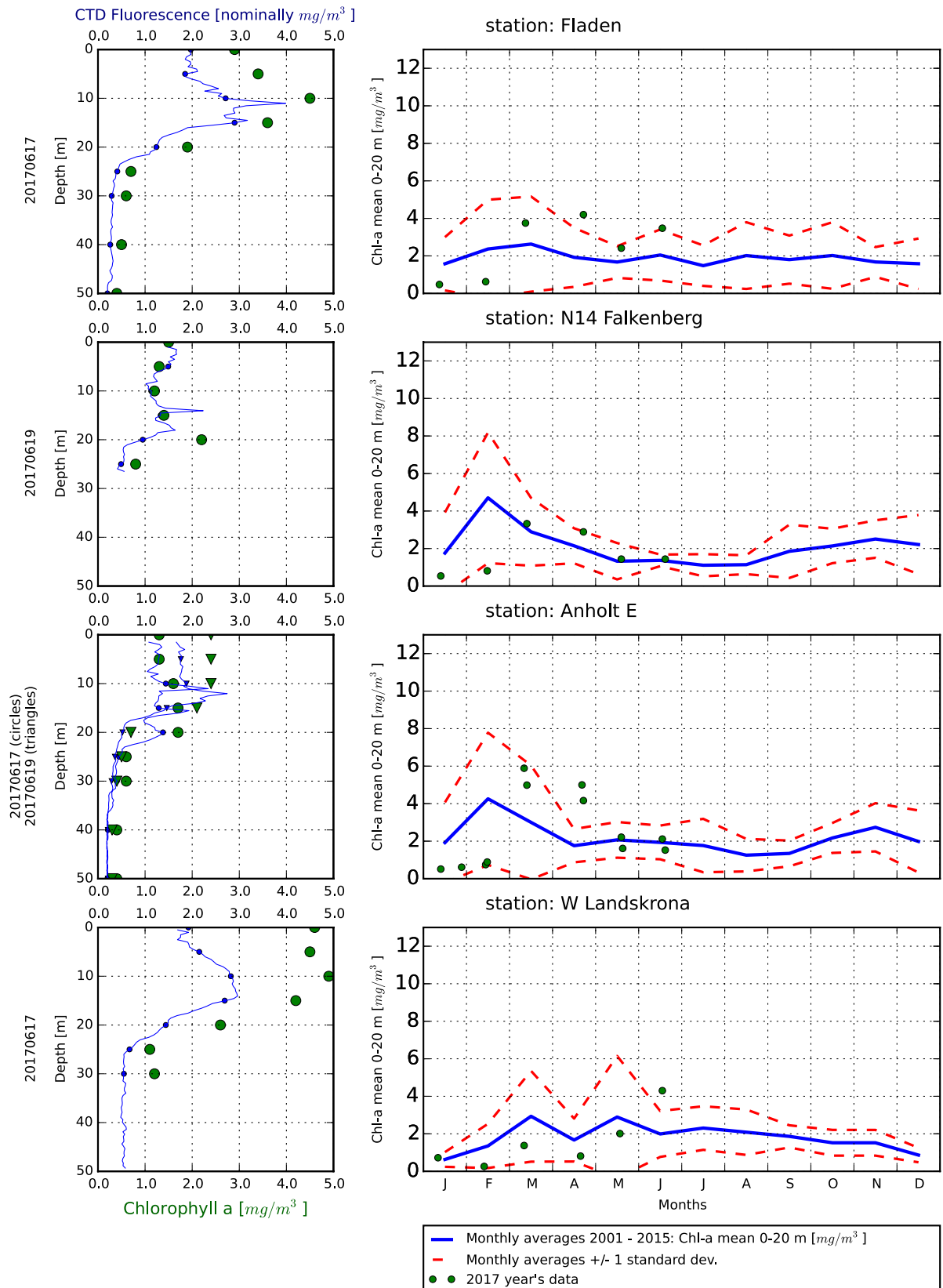
Selection of observed species	BY2	BY5	4CTRY BP	BY15	REF M1V1	BY38
Red=potentially toxic species	17/6	16/6	16/6	15/6	20/6	20/6
Hose 0-10 m	presence	presence	presence	presence	presence	presence
Chaetoceros impressus			present			present
Chaetoceros similis			present			
Chaetoceros wighamii						present
Aphanizomenon flosaquae	present	present	common	very common	very common	very common
Dolichospermum lemmermannii					common	present
Nodularia spumigena	present	present	present		common	common
Amylax triacantha				present		
Dinophysis acuminata			present	present		present
Dinophysis norvegica		present	present	present		
Gymnodiniales				common		
Phalacroma rotundatum						present
Protooperidinium brevipes			present			
Mesodinium rubrum				common		
Planctonema lauterbornii	present	present	present	present	present	present



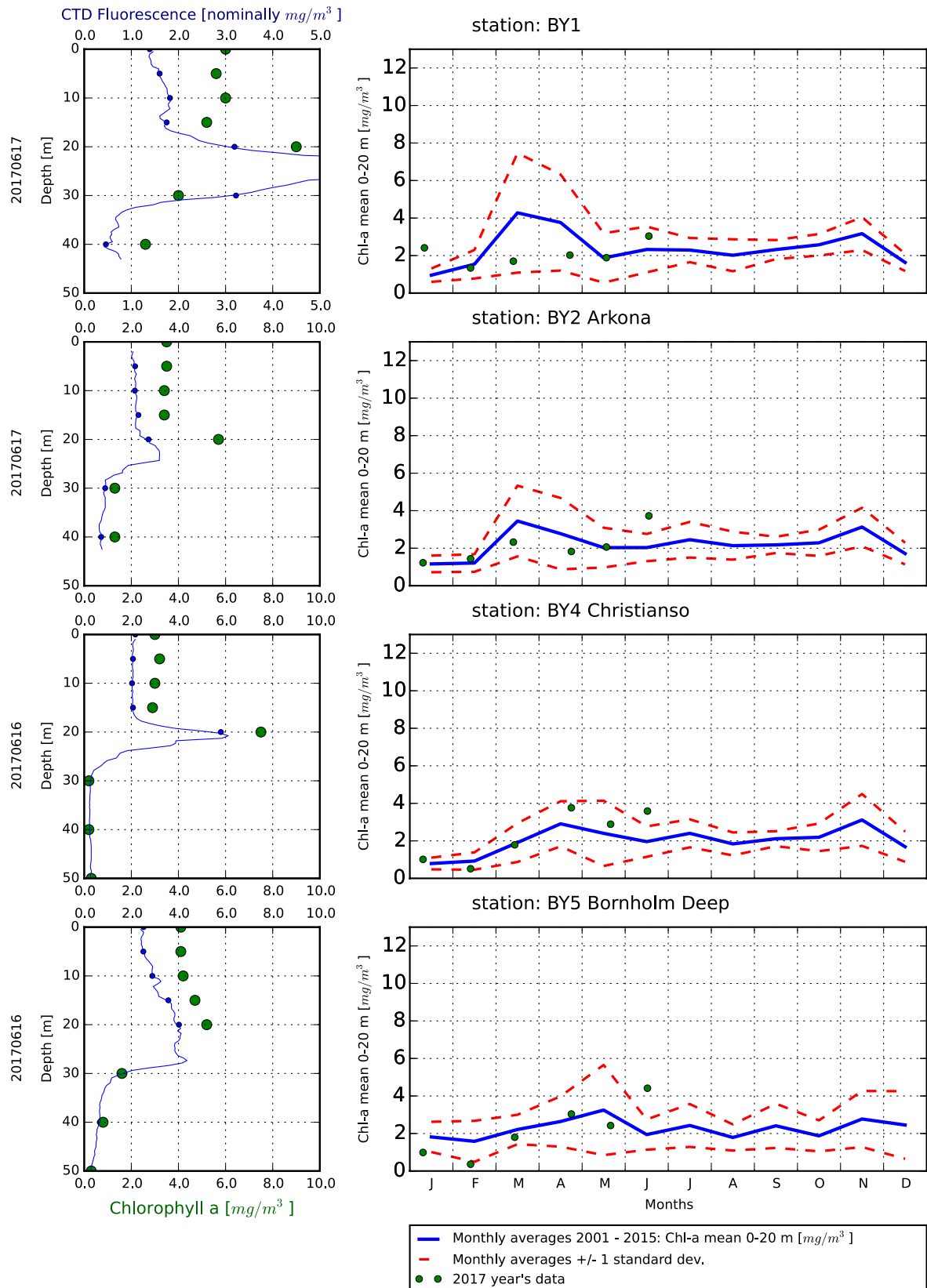
## The Skagerrak



# The Kattegat and The Sound

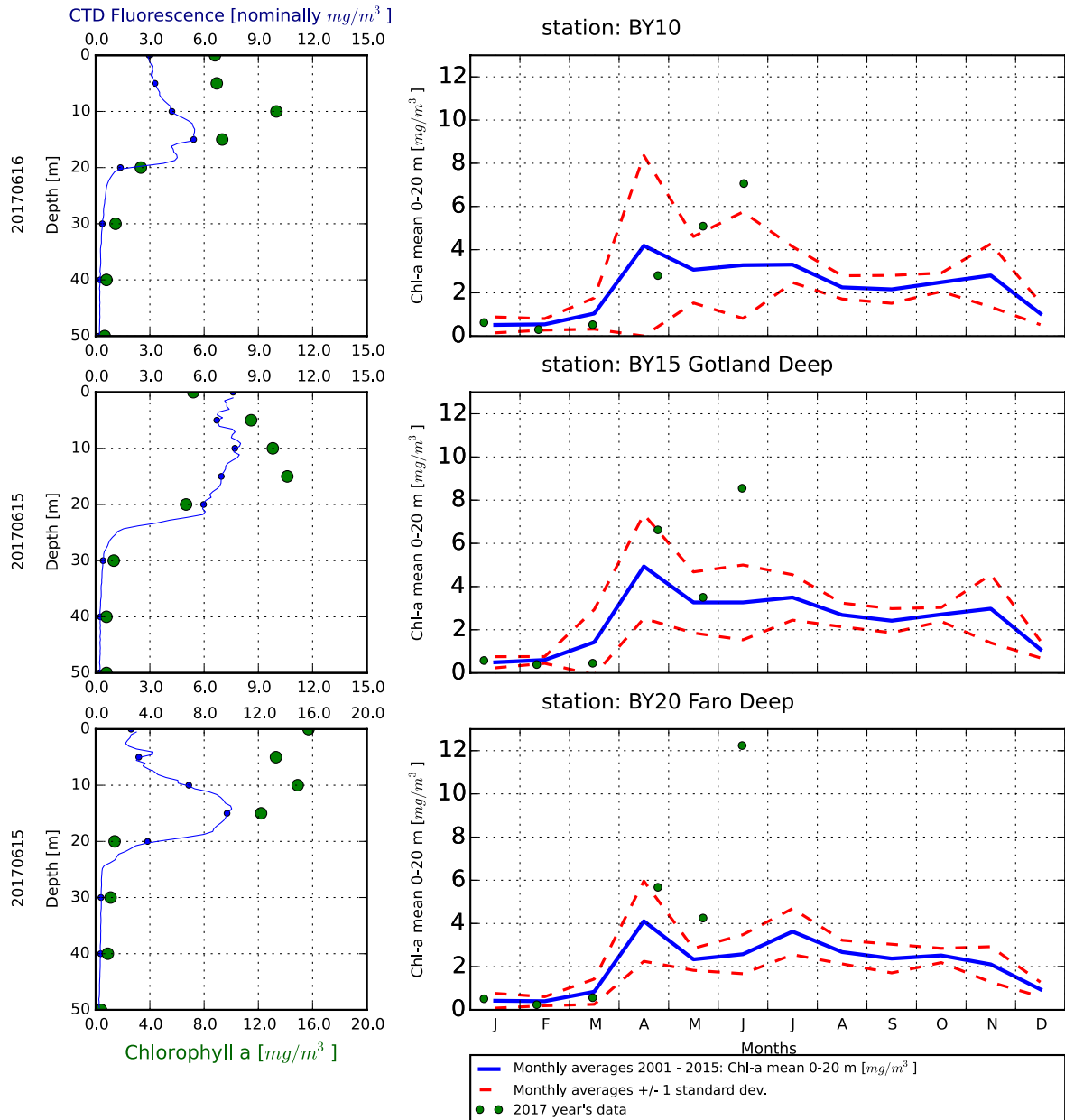


# The Southern Baltic



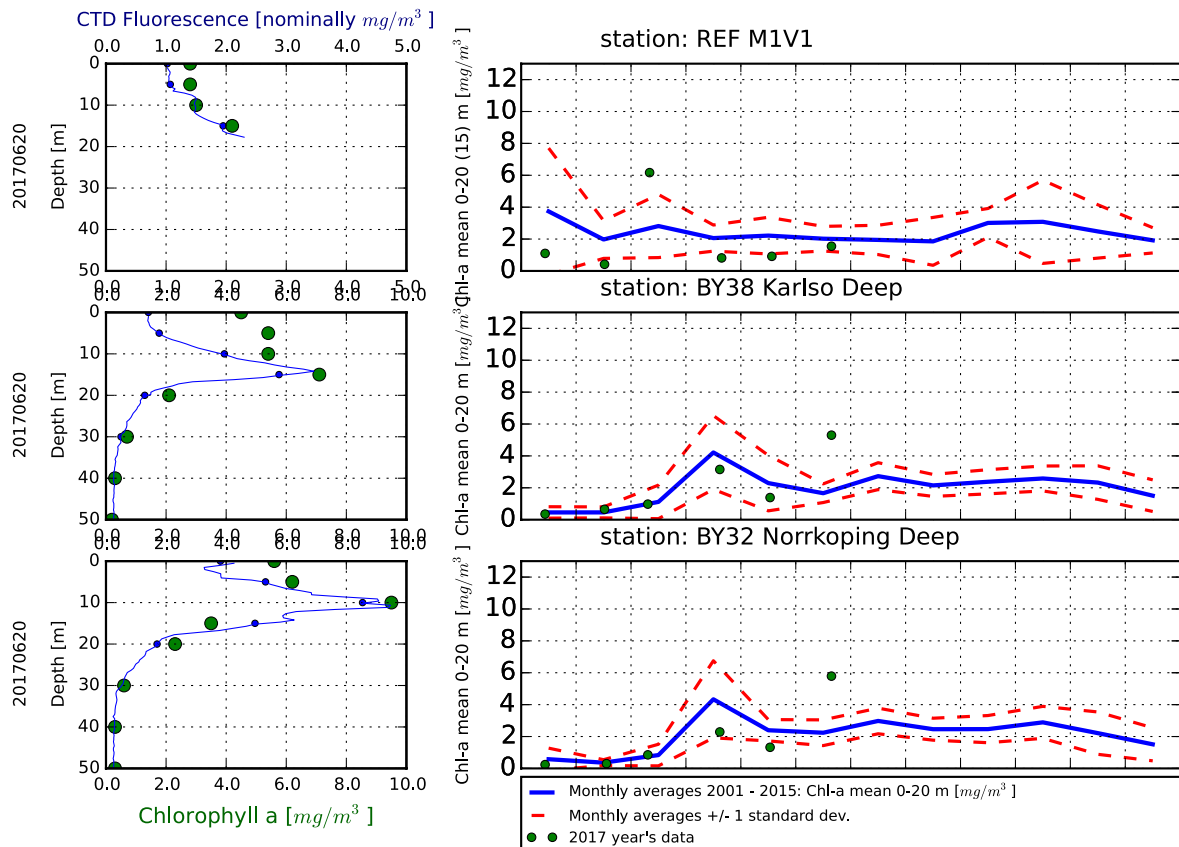


## The Eastern Baltic



Due to new Polish regulations, BCSIII-10 can not be visited for the time being.

## The Western Baltic



### Om klorofylldiagrammen

Klorofyll *a* är ett mått på mängden växtplankton. Prover tas från ett antal djup. Data presenteras både från de fasta djupen och som medelvärden 0-20 m. Utöver resultaten från laboratorieanalyserna av vattenprover mäts klorofyll *a* som fluorescens från ett automatiskt instrument som sänks ned från fartyget. På så sätt kan djupt liggande, ibland tunna lager av växtplankton observeras.

### About the chlorophyll graphs

Chlorophyll *a* is sampled from several depths. Data are presented both from the discrete depths and as an average 0-20 m. In addition to the laboratory analysis from the water samples chlorophyll fluorescence is measured in continuous depth profiles from the ship. This is a way to observe thin layers of phytoplankton occurring below the surface.

## Om AlgAware

SMHI genomför månatliga expeditioner i Östersjön och Västerhavet. Resultat baserade på semikvantitativ mikroskopanalys av planktonprover samt klorofyllmätningar presenteras kortfattat i denna rapport. Information från SMHIs satellitövervakning av algbloomningar finns under perioden juni-augusti på [www.smhi.se](http://www.smhi.se).

## About AlgAware

SMHI carries out monthly cruises in the Baltic and the Kattegat/Skagerrak. Results from semi quantitative microscopic analysis of phytoplankton samples as well as chlorophyll measurements are presented in brief in this report. Information from SMHIs satellite monitoring of algal blooms is found on [www.smhi.se](http://www.smhi.se) during the period June-August.

Art / Species	Gift / Toxin	Eventuella symptom	Clinical symptoms
<i>Alexandrium</i> spp.	Paralytic shellfish poisoning (PSP)	<b>Milda symptom:</b> Inom 30 min.: Stickningar eller en känsla av bedövning runt läpparna, som sprids gradvis till ansiktet och nacken; stickningar i fingertoppar och tår; Huvudvärk; yrsel, illamående, kräkningar, diarré <b>Extrema symptom:</b> Muskelförlamning; andningssvårigheter; känsla av att kvävas; Man kan vara död inom 2-24 timmar efter att ha fått i sig giftet, på grund av att andningsmuskulaturen förlamas.	<b>Mild case:</b> Within 30 min: tingling sensation or numbness around lips, gradually spreading to face and neck; prickly sensation in fingertips and toes; headache, dizziness, nausea, vomiting, diarrhoea. <b>Extreme case</b> Muscular paralysis; pronounced respiratory difficulty; choking sensation; death through respiratory paralysis may occur within 2-24 hours after ingestion.
<i>Dinophysis</i> spp.	Diarrhetic shellfish poisoning (DSP)	<b>Milda symptom:</b> Efter cirka 30 minuter till några timmar: yrsel, illamående, kräkningar, diarré, magont <b>Extrema symptom:</b> Upprepad exponering kan orsaka cancer	<b>Mild case:</b> Within 30 min-a few hours: dizziness, nausea, vomiting, diarrhoea, abdominal pain. <b>Extreme case:</b> Repeated exposure may cause cancer.
<i>Pseudo-nitzschia</i> spp.	Amnesic shellfish poisoning (ASP)	<b>Milda symptom:</b> Efter 3-5 timmar: yrsel, illamående, kräkningar, diarré, magkramp <b>Extrema symptom:</b> Yrsel, hallucinationer, förvirring, förlust av korttidsminnet, kramper	<b>Mild case:</b> Within 3-5 hours: dizziness, nausea, vomiting, diarrhoea, abdominal cramps. <b>Extreme case:</b> dizziness, hallucinations, confusion, loss of memory, cramps.
<i>Chaetoceros concavicornis</i> / <i>C. convolutus</i>	Mechanical damage through hooks on setae	<b>Låg celltäthet:</b> Ingen påverkan. <b>Hög celltäthet:</b> Fiskens gälar skadas, fisken dör.	<b>Low cell numbers:</b> No effect on fish. <b>High cell numbers:</b> Fish death due to gill damage.
<i>Pseudochattonella</i> spp.	Fish toxin	<b>Låg celltäthet:</b> Ingen påverkan. <b>Hög celltäthet:</b> Fiskens gälar skadas, fisken dör.	<b>Low cell numbers:</b> No effect on fish. <b>High cell numbers:</b> Fish death due to gill damage.

Översikt över några potentiellt skadliga alger och det aktuella giftets effekt. Overview of potentially harmful algae and effects of toxins. Manual on harmful marine microalgae (2003 - UNESCO Publishing).

Kartan på framsidan visar viktat medelvärde för klorofyll *a*, µg/l (0-10 m) vid de olika stationerna. Pil upp eller ned indikerar om resultatet är över eller under en standardavvikelse från medel. Medel är beräknat utifrån aktuell månad under perioden 2001-2015. Förekomst av skadliga alger vid stationer där arter analyseras markeras med symbol.

The map on the front page shows weighted mean of chlorophyll *a*, µg/l (0-10 m) at sampling stations. The arrow up or down indicate whether the result is above or below one standard deviation from mean. The mean value is calculated using results from the actual month during the period 2001-2015. Presence of harmful algae at stations where species analysis is performed is shown with a symbol.

